APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,812	03/18/2004	Lee Begeja	2003-0059 (ATT.0180000)	5880

26652 7590 01/05/2009	EXAMINER	
AT&T CORP. ROOM 2A207 ONE AT&T WAY BEDMINSTER, NJ 07921	HAN, QI	
	ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/802,812	BEGEJA ET AL.
	Examiner	Art Unit	
	QI HAN	2626	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>22 August 2008 and 22 October 2008</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☐ Claim(s) <u>1-8 and 17-20</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-8 and 17-20</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some *   c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____.

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

Continued Examination Under 37 CFR 1.114

2.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114.

Response to Amendment

3.   This communication is responsive to the applicant's amendment filed on 08/22/2008 and

RCE filed on 10/22/2008. The applicant(s) amended claim 1, and cancelled claims 9-16 (see the

amendment: pages 2-3).

        The examiner withdrew the claim rejection under 35 USC 112 1st, because the applicant

cancelled the corresponding claim(s).

Response to Arguments

4.   Applicant's arguments (i.e. in response to examiner's advisory office action filed on

09/12/2008) filed on 10/22/2008 (see Remarks: pages 2-7) with respect to the claim rejection

under 35 USC 102 and/or 103, have been fully considered but they are not persuasive.

      In response to applicant's arguments (regarding claim 1, also applied to 17) that the cited

portion (Fig. 9) of the reference (Arai) "is not asserted to teach generating call types" (Remarks:

page 2, paragraph 4), "there simply is no "generation" of call-types within the teachings of the

reference" (Remarks: page 3, paragraph 1), "the call-types are not generated based on a first set

of utterances as is recited in claim 1 but they are simply "given" as part of an argument for

processing by an equation… they be preexisting and thus not generated by the distancing

process" and "the call-types are not generated based on the first set of utterances but already

exist and are used ("given") along with the phrases as arguments to arrive at a probability

distribution based on the call-type frequencies" (Remarks: page 5, paragraphs 1-4), "the output

which is the distance based on the call-type probability distributions clearly does not involve the

generation of a plurality of call-types, each generated call-type being based on a first set of

utterances" (Remarks: page 5, paragraph 1), "this clustering process expressly draws upon a

preexisting call-type sets C which is provided to the various distant measurement equations…"

so that the argued/claimed "feature is not taught or suggested in teachings of the reference are"

(Remarks: page 5, paragraph 2 to page 7 paragraph 1), the examiner respectfully disagrees with

the applicant's arguments and has a different view of the prior art teachings and the claim

interpretations.

      It is noted that the applicants arguments still failed to treat the prior art teachings as a

whole, because the applicant's arguments showed that the applicant(s) treated the recited

references of the prior art (Arai) for the rejection as separate and unrelated peaces. In response

to the above applicant's arguments against the references individually, one cannot show

nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For example, at stated in the advisory office action, in general, a spoken language understanding system with statistical models (such as probability based models) necessarily and/or inherently involves two phases of operations: (i) (supervised or non-supervised) training operation for training models (generating or clustering models, in this case, including call-type models/classes) by using training data (in this case using collected utterances), and (ii) testing operation applying the trained models (classes or clusters) to input/test data for recognition (or classification). It can bee seen, as rejected, that the prior art (Arai) discloses **both** of these operations, as evidenced by Fig. 9, which includes 'clustering generation subsystem 1100' **'clustering (i.e. generating)** grammar fragments (i.e. clusters, classes or statistical models, including call-types in this case)' from 'test speech utterance (herein corresponding to training data)', and 'classification subsystem 1110' recognizing (or classifying) the grammar fragments (by using the trained/clustered models/clusters, at this point, they are existing) for input speech (corresponding to test data) (also see Figs 2, 4, and 11 ; col. 9, lines 1-47; col. 2, lines 13-35)". It is noted that Figure 9 is a high level structural block diagram of implementation of 'an exemplary speech recognition and understanding system', so that one of ordinary skill in the art would have readily recognized that the system would be applied to task-specific applications, such as recognizing call-type that is indeed disclosed and/or suggested by Arai (col. 3, lines 50-60), and would have combined the high level structure with other detailed teachings (such as in Figs 2, 4, and 11A-C; col. 9, lines 1-47; col. 2, lines 13-35) to implement the clustering and classification functionalities for the call-types.

Further, it is noted that even though applicant admitted that the prior art disclosed the training operation(s) and the recognizing/understanding system based on probability distributions of call-types (Remarks: pages 4-5), the applicant repeatedly argued that the prior art did not teach "generating call-type", instead, merely using "given" or "existing" call-types (Remarks: pages 4-5). These arguments are contradictory themselves, because basic goal (inherent feature) of training operation is to generate models/clusters/classes (i.e., in this case, generating grammar fragments including call-types) (Arai: col. 2, lines 13-35) and statistics (probability) based recognition (or clustering or classification) must calculate (generate) the corresponding probability of the models/clusters/classes (i.e. generating models) first **and then** use them. One of ordinary skill in the art would have recognized that generating (such as through calculating probability) statistics-based models (i.e. grammar fragments, in this case, including call-types) would be a necessary/inherent nature of the training operations, and **then** applying the recognized/clustered (i.e. given or existing) models to the testing input operation(s), which would be a common knowledge in the art, and the variation of which (such as used in different task-specific applications and/or syntactic/semantic associations) would be within the scope of capability of the skilled artisan in the art, and the result would be predicable. One of ordinary skill in the art would have also recognized that the process of estimating (obtaining) probability distribution of the call-types (Arai: equations 3-6 and col. 4, line 6 to col. 7, line 34) would substantially be the process of generating (clustering) statistical models (i.e. clusters, which, in this case, are grammar fragments including call-types), because without the generated/clustered grammar fragments including call-types, the recognizing and understanding spoken language could not be worked in normal operation at all.

Finally, it is additionally reminded that the second reference (ATTWATER) teaches that 'the sentences in supervised training corpus 42 are clustered using clustering algorithm' and 'clusters thus generated are manually checked' in which the words/phrases can be deleted or substituted (modified) in forming a cluster (col. 6, lines 1-22)', which further supports the examiner's rejection regarding the above argued/claimed limitation (see detail in the claim rejection).

For above reasons, the applicant's arguments are not persuasive and the claim rejection is sustained.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   Claims 1-3, 5-6, 8 and 17-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim(s) claim 1 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.   Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) **be tied to another statutory category** (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing.   While the instant claim(s) recite a

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, the claimed steps of "collecting…; generating…; testing...; modifying...; …", are of sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally or without a machine. It can be seen that the claim language itself is sufficiently broad to read on merely using a paper and pencil to analyze heard utterances and/or merely mentally stepping through the language understanding model processes. Therefore, the claimed invention, as whole, is directed to non-statutory subject matter.

Regarding claims 2-3, 5-6, 8 and 17-20, the rejection is based on the same reason as described for claim 1, because the claims include the same or similar problematic limitations as stated above for claim 1.

6.   To expedite a complete examination of the instant application the claims rejection under 35 U.S.C 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 103

7.   Claims 1-3, 5-6, 8-11, 13-14 and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over ARAI (US 6,173,261) in view of ATTWATER et al. (US 6,839,671) hereinafter referenced as ATTWATER.

As per **claim 1**, ARAI discloses 'grammar fragment acquisition using syntactic and semantic clustering' (title) 'for recognizing and understanding fluently spoken languages' (abstract), comprising:

"collecting a plurality of utterances" (Fig. 9 and col. 9, lines 14-8, 'database (collection) of a large number of utterances (collected plurality of utterances)');

"generating a plurality of call types, each generated call type being based on a first set of utterances selected from the collected plurality of utterances", (col. 2, lines 13-35, 'clustering phrases into grammar fragments' that are associated to the utterances, 'generate a collection of grammar fragments each representing a set of syntactically and semantically similar phrases' and used to 'determine a call classification (a call type)'; Fig. 9 and col. 9, line 1 to col. 10, line 45, 'a set of candidate phrases (including call types) having a probabilistic relationship with one or more of the set of predetermined routing objectives with which the input speech utterances are associated', 'call-type classification (generating call types)'; Fig. 2, also showing call types having/associating the training transcriptions (corresponding to the first set of utterances));

"generating a first natural language understanding model using call type information contained within said first set of utterances"(col. 2, lines 6-9 and 20-35, 'to utilize these grammar fragments (associating corresponding utterances) in language models (interpreted as natural language understanding models) for both speech recognition and understanding', 'salient sequences of these fragments may then be automatically acquired, which are then exploited by a spoken understanding module to determine a call classification'; Figs. 11a-11c and col.10, lines 30-45, 'as a consequence of this expansion, a fully expanded salient fragment network (also corresponding to the first natural language understanding model) is obtained (generated)');

"testing said first natural language understanding model" (col. 9, lines 61-67, 'recognition language model (natural language understanding model)', 'the training transcription contained 7,800 sentences while the test transcription contained 1000 sentences', which implies testing the language model);

Even though ARAI discloses that the grammar fragments formed from candidates phrases that generated from the training transcription (based on the testing) can be sorted based on call types (col. 6, lines 39-53), ARAI does not expressly disclose "**modifying** said plurality of call types based on said testing" and "**generating a second** natural language understanding model using said modified plurality of call types".   However, the feature is well known in the art as evidenced by ATTWATER who discloses 'learning of dialogue states and language model of spoken information system' (title) for creating 'a dialog model' using a training corpus of example human-human dialogues (abstract), comprising 'a natural language call steering system' in that 'the received speech utterance is analysed by the recognizer with reference to a language model' and using 'semantic model to form a semantic classification' that provides classifiers according to a predefined set of meanings (corresponding to call types) (col. 3, line 60 to col. 4, line 14), and teaches that 'the sentences in supervised training corpus 42 are clustered using clustering algorithm' and 'clusters thus generated are manually checked' in which the words/phrases can be deleted or substituted (modified) in forming a cluster (col. 6, lines 1-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that supervised training with manually checked clusters would provide capability of modifying the clusters/classes for the transcribed data so as to form a different language model, and to modify ARAI by combining the feature of using a candidate set of

grammar fragments associating the clustered call-types in the training transcription disclosed by

ARAI (col. 3, lines 1-60) and the feature of using supervised training and/or manually checking

(or transcribing) clusters with modifying capabilities, such as deleting or substituting, as taught

by ATTWATER (col. 6, lines 1-22), so that the call type of the candidate fragments associating

the utterances/transcription can be manually modified and another fully expanded salient

fragment network (second natural language understanding model) can be generated, for the

purpose (motivation) of generating more accurate transcriptions and/or improving call-type

classification performance for the system (ATTWATER: col. 6, lines 30-31; ARAI: col. 10, lines

21-22).

   As per **claim 2** (depending on claim 1), ARAI in view of ATTWATER further discloses

"generating an annotation guide using a second set of utterances which is a subset of said first set

of utterances" (ATTWATER: Fig. 3 and col. 5, lines 13-14, 'nodes… have been annotated with

operator utterance'; col. 11, lines 33-35, 'each call in the corpus can be annotated according to

the cluster of each operator utterance in the call', wherein the content of labels 26 in Fig.3, such

as 'greeting', can be reasonably interpreted as generated annotation guide as claimed; ARAI:

Fig.11C also suggests that the utterances corresponding to phrase 'collect call' (or 'collect phone

call') is a subset of the utterances of the consequence expansion (the model), so that it would

have been obvious to one of ordinary skill in the art at the time the invention was made to

combine the teachings from ARAI and ATTWATER by providing generated annotation

(annotation guide) using a subset of utterances of the consequence expansion, for the purpose

(motivation) of generating more accurate transcriptions and/or improving call-type classification

performance for the system (ATTWATER: col. 6, lines 30-31; ARAI: col. 10, lines 21-22)).

As per **claim 3** (depending on claim 1), ARAI in view of ATTWATER further discloses "generating call type data using at least **one of** data clustering, relevance feedback, string searching, data mining, and active learning tools" (ARAI: Fig. 9, 'grammar fragment (data) clustering'; ATTWATER: col. 5, lines 61-65, 'dynamic programming (DP) match (string searching)').

As per **claim 5** (depending on claim 1), ARAI in view of ATTWATER further discloses "said first natural language understanding model is trained using a first text file containing utterances contained within said first set of utterances and a second text file containing call types assigned to said utterances in said first text file" (ARAI: Fig. 9 and col. 9, line 4 to col. 10, line 45, wherein the 'database' with labeled utterances and training transcriptions necessarily include text file/table (first text file) linking (containing) the corresponding utterances, and the phases (text) classified with call types are also necessarily stored in a file or table (second text file) and linked (assigned) to the corresponding utterances; also see Figs. 7A-7C and 11A-11C).

As per **claim 6** (depending on claim 1), ARAI in view of ATTWATER further discloses "said natural language understanding model is tested using a subset of said first set of utterances" (ARAI: Fig. 9, 'test speech utterance' and 'input speech').

As per **claim 8** (depending on claim 1), ARAI in view of ATTWATER further discloses "said first natural language understanding model is created prior to an annotation guide" (ATTWATER: Fig. 3, wherein the content of labels 26, such as 'greeting', is interpreted as generated annotation guide; col. 11, lines 33-35, 'once the sentences in the training database have been clustered …each call in the corpus can be annotated **according to the cluster** of each

operator utterance in the call', which suggests the model is created prior to the annotation
(guide)).

As per **claims 17-20**, the rejection is based on the same reason described for claims 1-2
and 5-6, because it also reads on the limitations of claims 1-2 and 5-6 respectively.

8.   Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over ARAI in
view of ATTWATER as applied to claim 1, and further in view of MAES et al. (US
2003/0088421) hereinafter referenced as MAES.

As per **claim 4** (depending on claim 3), even though ARAI in view of ATTWATER
discloses generating call types, as stated above, ARAI in view of ATTWATER does not
expressly disclose "using a graphical user interface (GUI)." However, the feature is well known
in the art as evidenced by MAES who discloses 'application that supports multi-modal',
'conversational applications' utilizing 'NLU (natural language understanding)', 'multi-modal
interactive dialog comprises modalities such as speech, visual (GUI)…and a combination of such
modalities (e.g. speech and GUI)' (p(paragraph)46); and 'multi-modal browser application
comprise a GUI browser' (p73). Therefore, it would have been obvious to one of ordinary skill
in the art at the time the invention was made to modify ARAI in view of ATTWATER by
combining the feature of generating call types as stated for claims 1 and 3, with feature of
supporting multi-modal applications including using GUI, as taught by MAES, for the purpose
(motivation) of better disambiguating and understanding the user's intention and/or displaying
the related presenting and updating information (MAES: p46, p244).

As per **claim 7** (depending on claim 1), the rejection is based on the same reason

described for claim 4, because the claim recites the same or similar limitation(s) as claim 4.

Conclusion

9.   Please address mail to be delivered by the United States Postal Service (USPS) as
follows:
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        Any inquiry concerning this communication or earlier communications from the
examiner should be directed to QI HAN whose telephone number is (571)272-7604. The
examiner can normally be reached on M-TH:9:00-19:30.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the
organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QH/qh
January 4, 2009
/Qi Han/
Examiner, Art Unit 2626